Training Manual

Application / Procedures for the Development and Approval of Continuing Education Training Programs

The Office Of Emergency Medical Services

56 Roland Street, Suite 100
Boston, MA 02129
(617) 284-8300
www.state.ma.us/dph/oems

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Introduction

The OEMS Training Manual (Application / Procedures for the Development and Approval of Continuing Education Training Programs) is written for those who share the responsibility for providing educational programs to EMTs, at all levels, (Basic, Intermediate, and Paramedic) certified in Massachusetts. The manual was developed by the Emergency Medical Services Advisory Board through its Training Subcommittee, with assistance from the staff of OEMS.

The purpose of this manual is to provide simple and clear guidance to any person or organization who sponsors EMT continuing education or refresher courses. This manual will also assist sponsors of special courses including automatic defibrillation, epinephrine auto-injector training and ALS/BLS Interface training, all of which have specific curriculum requirements.

This manual **DOES NOT** provide information on initial certification programs. If you are interested in sponsoring EMT-Basic, Intermediate or Paramedic certification preparation courses we suggest you contact OEMS directly as these programs have special course sponsor and/or instructor requirements.

This manual is divided into six Chapters and an Appendix section. The chapters cover everything you need to know regarding refresher training and continuing education programs from filling out the "Application for Approval" form and writing a comprehensive outline, to choosing a suitable instructor. The forms in the Appendix can be photocopied for future use. A *Glossary* of commonly used terms and organizations will help you understand some of the terms in the manual. Finally, a resource guide is included to help you obtain the materials you might need to provide current and comprehensive programs.

Updates to this manual will be provided upon request to anyone who has sponsored a continuing education program or refresher program.

The Training Subcommittee hopes this manual is helpful to you and will lead to quality programs. Your suggestions on how to improve this manual can be made directly to OEMS, who will report to the Training Subcommittee.

Course sponsors, training officers and others involved in providing EMS training are urged to obtain a copy of the current EMS regulations from the State House Bookstore. Call (617) 727-2834 for current price and ordering information. Ask for a copy of the EMS Regulations, 105 CMR 170.000.

Copies of the Massachusetts General Laws (MGL) are found at most public libraries. Certain laws affecting EMS may be useful to course sponsors. Such laws include the state EMS law, Medical Practice law, Nurse Practice law, Good Samaritan laws, motor vehicle laws, Food & Drug laws, First Responder law, Unprotected Exposure law, etc.

You are encouraged to reproduce all or any part of this document to assist you in putting on training programs. Additional copies of this manual may be obtained from OEMS.

Because of the nature of this document revisions will be made on a periodic basis. Please check the OEMS web-page from time to time to insure you have the latest revision.

www.state.ma.us/dph/oems

Chapter I
Recertification Requirements

New EMTs are initially certified upon successful completion of the Massachusetts exam process. After variable initial certification period, EMT's must renew their certification every two years. Recertification requirements for each level are described below:

EMT Basic (MAST/Ambulance)

DOT level, EMT Refresher course (minimum 24 hours)
28 additional hours of approved EMT-Basic level recertification credit classes ("Continuing Education")
BLS-CPR credential

EMT-Intermediate

DOT level, EMT Intermediate Refresher course (minimum 36 hours)
28 additional hours of approved EMT Intermediate level recertification credit classes
BLS-CPR credential

EMT-Paramedic

DOT level, EMT Paramedic Refresher course (minimum 48 hours)
25 additional hours of approved EMT-Paramedic level recertification credit classes
Biennial recertification in ACLS
BLS-CPR credential

All Basic EMTs, Intermediates and Paramedics will receive a computer printout of what OEMS has on file for their completed recertification requirements in July and October prior to their certification expiration date. Along with these printouts, OEMS will forward an EMT Recertification Application and a "Discrepancy Report". The EMT should complete the Discrepancy Report and send it to OEMS immediately with copies of proof of attendance (and course outline if not pre-approved by OEMS), if he/she has completed any programs which OEMS does not have listed on the computer printout.

The Basic EMT, Intermediate or Paramedic should complete and return their Recertification Application and the appropriate fee, and if a Paramedic, a copy (front & back) of their current ACLS card immediately upon receipt. Do NOT wait until all recertification requirements have been completed to file the application and fee!

You must complete all recertification requirements on or BEFORE December 31 prior to the expiration date listed on your EMT certificate! If you file your Recertification Application and fee early, even before you complete the recertification requirements, OEMS will send you your new EMT certificate when you do complete the last requirement.

ALL RECERTIFICATION REQUIREMENTS MUST BE COMPLETED BY MIDNIGHT DECEMBER 31st PRIOR TO THE LISTED EXPIRATION DATE.

Chapter II

How to Submit a Continuing Education Training Course Program to OEMS for Approval

After deciding the topic for a continuing education program, the instructor or program coordinator must do the following:

1. Complete a Program Outline
2. Choose an Instructor
3. Complete OEMS Form 200-46: Application for Approval of EMT Continuing Education Training Program
4. Submit Form 200-46 and the Program Outline to the appropriate Regional EMS Office six weeks or more prior to the date of the program

Note: Continuing education that is sponsored by a Region or is conducted by Region staff must be approved by OEMS prior to conducting the class. For these programs, the Regional "recommendation" portion of the application is to be left blank. Forward copies of all documentation or backup material related to the course with the application.

The Application and outline is first reviewed by the Regional Office. The Regional Office reviews the application according to standardized criteria set by OEMS. If the program is deficient, the Regional Office will contact the Program Coordinator and attempt to assist them in correcting the deficiency before sending it on to OEMS. When the Regional Office recommends approval, the application will be forwarded to OEMS. Continuing Education applications that have been reviewed and recommended by a Region will be approved, assigned approval number and returned to originator within 3 weeks of receipt by OEMS. This approval number must appear on all further course documentation. It is imperative that the application and outline be submitted to the Regional Office **six weeks** prior to the date the course is scheduled to begin. (See Appendix A for a list of Regional Offices)

How to Complete a Program Outline

The following is the recommended format for a program outline. A sample outline follows this format.

1. TOPIC:

Write the name of the program/subject to be covered. The topic should be a descriptive title of the program.

2. PREREQUISITE:

These are the minimum requirements (attendance, grades, etc.) for participation in the course, including what level(s) of EMT may attend. It would also state if a participant had to have any prerequisites such as training in CPR or session 1 of a multi-session program.

3. COURSE FORMAT (TEACHING METHODS)/ LENGTH OF PROGRAM:

Credit hours are awarded on an hour for hour basis for the actual instructional time on EMS related topics. No half hour or quarter hour credits are awarded.

4. FACULTY:

In this section, the instructor and any additional faculty would be identified. Acceptability of instructors shall be based on the following EMCAB Training Committee recommendation:

"The faculty shall be qualified through academic preparation, training and experience to teach the course(s) and topics identified in the curriculum. Evidence shall indicate faculty member expertise in the area of assigned instruction."

5. REFERENCE MATERIAL:

List the resource material(s) that the instructor used to plan the course. These might include a current textbook, magazine articles, AHA guidelines, OSHA materials, etc. Teaching aides such as slides, video tapes, and overheads should also be listed.

6. TESTING/EVALUATION:

Specific evaluation tools are **required** for refresher, defibrillator, and epi-pen courses are strongly recommended for all EMS training programs. If a test/quiz/practical exam (not required) will be used in a course, it should be mentioned here.

For further information and/or requirements for SAED/AED defibrillation and epi-pen courses for EMT-Basics, please consult with the appropriate Regional office.

7. CURRICULUM:

This section defines the specific purpose of the program, the learning objectives and the course timetable.

A. **Purpose:** Why is this program being offered? What is the goal you hope to accomplish by conducting this program?

B. **Learning objectives:** What do you expect the participant will be able to do after he/she has completed the program?

According to Webster's New Collegiate Dictionary, an objective is "something toward which effort is directed, an aim or end of action."

Objectives are necessary at all levels of education because they provide the student with a clear description of the goals to be achieved. When an instructor plans the program, it must be based on clear objectives that leave no doubt concerning the result sought from the student.

Identifying the acceptable end result behavior is the first and most important step in developing well-written learning objectives. The instructor must state the objective so one can clearly see exactly what the student must accomplish to achieve it. Verbs such as “solve”, “demonstrate”, “write”, and “complete” denote behavior that a teacher can clearly observe. Verbs such as “understand”, “appreciate”, “like” and “value” on the other hand, are very broad and leave a great deal to the imagination when used in objectives.

The following list contains words which instructors should consider to develop learning objectives:

apply	demonstrate	name
assess	describe	plan
bring	design	recite
build	diagram	repeat
change	differentiate	respond
chart	draw	say
codify	employ	show
compare	explain	solve
construct	express	tell
contrast	identify	write
define	list	
delineate	mark	

C. **Program Outline:**

Outline the material to be presented and give the exact times devoted to each section to ensure the course content will meet the desired learning objectives. Outlines should be sufficiently detailed so that the range of material to be covered is clear and the logic of the presentation is laid out. The following sample is a recommended model.

Sample Course Outline - Continuing Education

INSTRUCTIONS: Please complete this form (or supply your own content outline) with the Application for Approval form, as directed on the back of Form 200-46.

1. Write the name of the program (the subject to be covered)
2. Write the name of the instructor(s); list specific credentials for teaching this program
3. Explain why this program is being offered. What goal(s) do you wish to accomplish?
4. Outline the material to be covered; give time frame devoted to each section
5. List the planned teaching method(s), lecture, pre/post tests, slides, films, hands on practice, case reviews, etc.
6. List the resource materials that are being used to plan the course (text, EMS journal article, interview with expert, etc.)

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1. TOPIC: Extremity Splinting at an MCI or Disaster Scene

2. Instructor (Credentials): EMT-M John Doe, Training Officer, LMN Ambulance; James Smith, EMT-M, Senior EMT; Jane Jones, EMT-M

3. Objectives:

At the end of this class each EMT will demonstrate their ability to apply at least three different types of splints to both lower and upper extremity injuries. In addition, each EMT will solve a "problem" involving the failure of one part of the traction leg splint. EMTs will use “improvised” splinting materials due to large number of patients with extremity injuries. All available “commercial” splints have been used.

4. Program Content — Time Frame per Section

7:00pm Each Instructor aide will break out with 4 EMTs who will pair off — 30 min.

	and apply improvised upper extremity splints	
7:30pm	Each Instructor aide will break out with 4 EMTs who will pair off and apply improvised lower extremity splints	30 min.
8:00pm	BREAK	10 min.
8:10pm	Instructors will review skill sheets with teams	10 min.
8:20pm	Instructors will disable/remove one part of Hare traction splint & EMT will improvise replacement or repair affected part & apply traction leg splint	20 min.
8:40pm	Instructor will evaluate & critique EMTs ability to treat a patient with deformed, swollen, painful thigh bones using improvised traction splints.	20 min.
9:00pm	Question & answer Period/ Critique	10 min.
9:10pm	Program Ends	

5. Teaching Method(s): Hands on practical skills application, evaluation & critique

6. Resource Materials:

Brady, "Emergency Care", current edition; AAOS, "Emergency Care & Transportation", current edition; Mosby, "Basic EMT Skills & Equipment" (for list of current additions check OEMS web-page)
1 Hare Traction Splint; 4 long, 4 medium & 4 short padded board splints; 2 long backboards; assorted cravats and triangular bandages, blankets, towels, magazines, newspapers, asst. 1" x 2' and 1" x 4' boards, broomsticks, umbrella's, hockey sticks, etc. Splinting skill evaluation sheets

How to Choose an Instructor

The selection is as important as the process of determining what material you are going to present in a continuing education program (selection of the instructor or instructors). It is important to remember that the Regional Office will be evaluating the faculty to determine if they are qualified to instruct in the program.

As stated on page 3 of the manual: **"the faculty shall be qualified through academic preparation, training and experience to teach the courses and topic identified in the curriculum. Evidence shall indicate faculty member expertise in the area of assigned instruction."**

Recommended Selection Criteria

When evaluating potential instructors, pay close attention to experience, example:

- Minimum of one year experience as an EMT (paid or volunteer) involved in patient care
- Number of courses previously taught
- Types of courses taught (initial EMT course instructor aide, first aid, CPR, EMT recertification, EMT Refresher and other health/science related courses).

The instructor may be a member of your department, company, hospital, social service, etc. as long as their qualifications suit the material presented. If there are no qualified instructors within your organization, a qualified guest speaker should be solicited.

How to Find (or select) Resource Materials

Course sponsors and/or instructors may wish to obtain copies of the following texts. These texts contain a wealth of information about adult learning concepts, instructional media, student evaluation, course coordination and many helpful hints and suggestions for improving EMS education.

"Instructional Methods in Emergency Services", Brady Publishing

"Teaching EMS", Mosby/Lifeline Publishing

"EMT TEACHING A Common-Sense Approach", Brady Publishing

How to complete the Continuing Education Training Program Application (OEMS Form 200-46)

Once you have completed your program outline, chosen a location, date(s) and time(s) for your course, you will have all the information necessary to complete Form 200-46.

The completed Application Form 200-46, the outline as described in the previous section must be submitted to the Regional EMS Office (in which the program will take place) ***AT LEAST SIX WEEKS PRIOR TO THE PROGRAM START DATE.*** A list of Regional EMS Offices can be found in appendix A.

One possible exception to this filing date is when an unannounced Mass Casualty Drill has been conducted. Recognizing that there are legitimate educational reasons for occasionally conducting "surprise" drills, OEMS will allow the program coordinator to submit the application after the drill. Other programs may be held with short notice due to local needs, instructor availability, etc. Attach a written explanation for the "late" filing to your program outline.

SAMPLE REVIEW CRITERIA - EMT Continuing Education Training Course

A. Application

YES	NO	
( )	( )	Type of Program Identified
( )	( )	Date(s) for the program provided
( )	( )	Times for the program provided
( )	( )	Name, address & telephone of Course coordinator
( )	( )	Requested credit hours identified
( )	( )	Specific location (bldg., room) of program identified
( )	( )	Primary instructor identified
( )	( )	Application signed by the program/course coordinator
( )	( )	Application signed by appropriate Region Training Committee/Office
( )	( )	Application was submitted to the Region Training Committee four weeks in advance of Program
( )	( )	Detailed course outline attached

B. Outline

YES	NO

( )	( )	Learning objectives identified
( )	( )	Relevance to EMT roles and responsibilities identified
( )	( )	EMT-Basic/MAST content documented sufficiently
( )	( )	EMT-Intermediate content documented sufficiently and content complies with State Treatment Protocols
( )	( )	EMT-Paramedic content documented sufficiently and content complies with State Treatment Protocols
( )	( )	Teaching plan/methods identified
( )	( )	Instructional media identified, i.e., film, slides, handouts, text, etc.
( )	( )	Amount of time allotted for each topic identified
( )	( )	Time for breaks, meal, etc. not included in total class hours
( )	( )	Measurement/evaluation tool included when applicable by instructor

NECESSARY ACTION

( ) Revise the program outline to correct deficiency(s) identified and return the application/outline to appropriate Regional office.

( ) Provide written explanation as to why the application and outline were not submitted for Region Training Committee review at least six weeks in advance.

If you have any questions pertaining to the development of your training program please contact your local Regional office.

Approval Process and Course Completion Paperwork

The Application packet will be reviewed by the Regional Office (if Region is directly involved in course sponsorship, application will only be reviewed by OEMS) and then forwarded to OEMS. When a program is approved, OEMS will issue an approval number and return (within three weeks of receipt) to the Program Coordinator with an Official OEMS Attendance Roster, Form 200-59.

The Course Sponsor should check the approval notice carefully to see how many hours the program was actually approved for and at what levels.

The Course Sponsor must have all participants sign the roster(s) and return the original(s) to OEMS not more than five (5) business days after completion of the course. A copy of the roster(s) should be kept on file with the course sponsor.

The sponsor should verify that the number of attendees matches the number of signatures on the roster(s). EMTs who fail to sign the attendance roster(s) will not receive credit for attending the course.

Chapter III
How to Submit a Refresher Course Training Program Outline to OEMS for Approval

All levels of EMTs in the Commonwealth are required to take a refresher once during each two year recertification period. The Program outlines for each level contain required topics and time minimums that follow in this chapter. Regardless of the certification level of the Refresher Program to be held, the

Program Coordinator must do the following:

1. Complete a Program Outline
2. Choose Instructors

3. Complete the Program Schedule
4. Complete OEMS form 200-46 (application for approval)
5. Devise Testing Materials to include both written and practical components.
6. Submit packet of above materials to the appropriate Regional EMS office at least **six weeks** prior to program commencement.

The Application outline is first reviewed by the Regional Office according to standardized criteria. If the program is deficient, the Regional Office will contact the Course Sponsor and attempt to assist them in correcting the deficiency before sending it on to the State. After the Region reviews the refresher, the application is forwarded to OEMS. If approved by OEMS, an approval number will be assigned and returned to the course sponsor. It is imperative that the outlines be submitted to the Regional Office at least **six weeks** prior to the date the course is scheduled to begin. (See Appendix A for a list of Regional Offices).

How to Complete a Refresher Course Training Program Outline

The following is the recommended format for an outline.

1. TOPIC: Write the EMT Level of the program to be run (EG. EMT-I Refresher)

2. PREREQUISITES: These are the minimum requirements for the participation in this level refresher program. (i.e., EMT-Basic Refresher: must be an EMT-Basic or EMT-I)

3. FORMAT: Program format should include the length of the program (this should be both the overall length of the program as well as time in each sub-topic), teaching methods (i.e., lectures, videos, slides, labs). Refresher Program's length depends on the EMT level the program is intended for (Basic = 24 hours; EMT-I Add On = Basic refresher plus 12 hours; and Paramedic = 48 hours).

4. FACULTY: The Primary Instructor and any additional faculty are identified in this section. The Regional office and OEMS bases their decision on instructor qualifications using the following as a guide: **"the faculty shall be qualified through academic preparation, training and experience to teach the courses and topics identified in the curriculum. Evidence shall indicate faculty member expertise in the area of assigned instruction."**

5. REFERENCE MATERIAL: List the resource material that the instructor used to plan the course. These might include a current textbook, magazine articles, AHA guidelines, OSHA materials, etc. Teaching aides such as slides, video tapes, overheads should also be also be listed by title, edition, tape number, etc.

6. TESTING/EVALUATION: Mandatory testing is required for all levels of EMT Refreshers, including both practical and written components. Written exams and practical exam guidelines must be submitted with the program application.

7. CURRICULUM: This section defines the specific purpose of the program, the learning objectives, and the course timetable. The "Purpose" and "Learning Objectives" in a refresher program are usually stated at the beginning of the DOT Outline. If you write your own objectives, simply state what you expect the participant to be able to do at the completion of the program. (See Chapter 2, Section 7 on how to write objectives)

8. OUTLINE AND MODULES: Program Outlines must follow the Department of Transportation (DOT) Guidelines for the EMT-Basic (24 hours), EMT-Intermediate and Paramedic levels.

NOTE: Any Basic EMT who wishes to maintain state certification and/or his/her membership in the National Registry must take a DOT level Basic Refresher. The Program Outline must identify the exact times devoted to each section to ensure the course content will meet the desired learning objectives. DO NOT include meal or break times in the hours you are requesting for credit. Programs that last the full day must allow for meal and break times.

How to Choose an Instructor

See Chapter 2, Page 5, "How to Choose an Instructor"

How to Complete A (Refresher) Continuing Education Training Program Application (OEMS Form 200-46)

See Chapter 2, Page 6, "How to Complete a Continuing Education Training Program Application (OEMS Form 200-46)

CONTINUING EDUCATION
PREHOSPITAL EMS SKILL SUMMARY SHEET

The purpose of this form is to identify some of the primary treatment procedures that may be performed by each level of EMT in Massachusetts. This is to help assure that the instructors for EMS continuing education programs and Regional reviewers will understand that each level of EMT in attendance must be able to understand his/her individual and collective roles and responsibilities in rendering the required standards of care as defined by their level of certification, national standards of care, state guidelines and regional protocols.

Continuing education outline(s), must identify the necessary assessment skills and treatment protocols that are consistent with the established standards of care for each level of certification as it pertains to the subject being discussed. **These treatment procedures may include, but are not limited to the following:**

BASIC	***INTERMEDIATE***	***PARAMEDIC***
oxygen therapy	All Basic Skills	All Basic & EMT-I Skill(s)
airway adjuncts	esophageal gastric tube airway	endotracheal intubation
airway control	PASG/MAST	cardiac monitor/pacing
CPR	IVs (D5W, NS, LR)	administration of medication(s)
bandaging	any other skill(s)* as defined	any other skill(s)* as defined by
splinting techniques	by protocol and credentials	protocol and credentials
spinal immobilization		
PASG/MAST		
any other skill(s)* as defined by protocol and credentials		

NOTE: *The above list of skills does not identify all of the required skills, however it addresses the primary ones. Specific skills identified with an asterisk(*) signify specialized skills that require additional credential by the Medical Director. These may include the following:*

BASIC SKILLS: Defibrillation (AED/SAED), Epinephrine Auto-Injectors

INTERMEDIATE SKILLS: Defibrillation (AED/SAED) and endotracheal intubation (ET), or Epinephrine Auto-injectors

PARAMEDIC SKILLS: Needle Chest Decompression, intraosseous infusions, needle cricothyrotomy, Epinephrine Auto-Injectors or any other OEMS approved advanced special skill(s).

When the instructor(s) is/are discussing patient care information that is above the scope of care for any given EMS provider in attendance, the instructor must identify this component of the lecture as "for informational purposes ***ONLY***" and should serve as an ALS/BLS interface component. Under no circumstances should any EMT(s) be allowed to interpret this information as official training to perform any procedure(s) above their level of certification.

The above information is to ensure that both the instructors and the EMTs understand the great potential for liability should they fail to perform within the required standards of care and within their level of training, roles, and/or responsibilities.

1994 CURRICULUM EMT-B REFRESHER COURSE - MINIMUM REQUIREMENTS

Download copy of EMT-B Refresher curriculum from EMS home page:
http//www.nhtsa.dot.gov/people/injury/ems; OR
purchase copy from Government Printing Office. Call (202) 512-1800 and ask for ordering information and price for document #050-003-00433-2.

LEAD INSTRUCTOR QUALIFICATIONS

1) State Certified EMT- Basic (EMT-A, EMT-M, EMT-I or EMT-P who has completed a state approved, Revised 1994 DOT Curriculum EMT-B Refresher and/or Revised 1994 DOT Curriculum EMT-B Transition course, with current instructor authorization/certification, OR
2) EMT-I or EMT-P who has attended an Revised 1994 DOT Curriculum EMT-B Refresher/Transition course, with current instructor authorization/certification, OR
3) EMT I/C who has attended state Revised 1994 DOT Curriculum Rollout program.

INSTRUCTOR AIDE QUALIFICATIONS

EMT-Basic (EMT-A, EMT-M, EMT-I or EMT-P who has completed a state approved, Revised 1994 DOT Curriculum EMT-B Refresher and/or EMT-B Transition course.

LENGTH

Minimum 24 hours conducted over at least three days.

SCHEDULING

In order to meet the DOT and state standards, each EMT-B refresher course--exclusive of CPR recertification or S/AED training--must run a minimum of TWENTY-FOUR hours.

Refresher courses must be conducted over three separate days at a minimum; total class time per day may not exceed eight hours. TWO DAY REFRESHER COURSES WILL NOT BE APPROVED BY OEMS. Refresher courses must be completed (start and end) in the same calendar year. EMTs must complete all refresher course requirements (class attendance, written quizzes and tests, practical skills examination, make-up work, etc.) within the calendar year in which the course began.

The modular construction of the DOT curriculum allows course sponsors the advantage of offering refresher training one module at a time over an extended period (maximum one calendar year). In planning the schedule the sponsor must keep the following in mind:

(1) the commitment must be to provide a complete EMT refresher training program; an individual module or modules may NOT be offered independent of the others--the Application for Approval packet must account for all seven modules;

(2) EMTs must complete ALL requirements of the refresher course (100% attendance through all seven modules including all topics, completion of all required assignments, successful completion of all in-course tests and quizzes, etc.) within a single calendar year, in order to recertify as EMTs; course sponsors are encouraged to think about allowing time for make up work that students may need to do when scheduling classes toward the end of the calendar year;

(3) it is the responsibility of the course sponsor to ensure that his/her students complete all

requirements of the refresher course. Sponsors may refer students to other refresher courses to make up required work that has been missed, or sponsors may offer time for make up work on their own. In

any event, each EMT must complete the requirements of a single refresher course, under one OEMS approval number; the course sponsor must document completion of course requirements for each student on an OEMS Master Attendance List.

WARNING!: Do not assume that Lesson 3 of another refresher course corresponds to your Lesson 3. If you send one of your students to another refresher course, make sure that all of the material the EMT missed will be covered in the session(s) you are sending the EMT to make up. Due to the unique nature of each EMT refresher course (scheduling & content variations due to local needs assessment) it may not be possible to find another refresher course offering the material that needs to be made up in a single session.

TESTING

Course sponsors are responsible for evaluating student knowledge both through written and practical skills examination. Testing (written and practical) may conclude the course, may be given at the end of each module, or may be integrated into the teaching lessons themselves. Passing the in-course evaluations is a requirement for successful completion of a refresher course.

Copies of all quizzes, tests, grades, and practical skill evaluation sheets used in refresher courses must be kept on file by course sponsors and made available for review by OEMS for a period of no less than two years after the completion date of the course.

APPROVAL PROCESS

To request approval for a refresher course the sponsor must submit the following:

(1) a completed Application for Approval (OEMS Form #200-46)
(2) a completed class schedule and content outline
(3) a completed Instructional Method Sheet: DOT Basic EMT Refresher Course
(4) copy(ies) of the Primary instructor's certification(s) as a qualified instructor
(5) Copies of written and practical exam evaluation tool(s) & answer key(s)

1994 CURRICULUM EMT-B REFRESHER COURSE - MINIMUM REQUIREMENTS

Content

Module 1 - Preparatory

[OBJECTIVES: Cognitive - 8; Affective - 4; Psychomotor - 2]

I. Scene safety (BSI & Personal Protection)
II Quality Improvement (Medical Direction)
III Health & Safety (Lifting & moving pts., stess, CISD)
IV Medical - Legal (Consent, refusal, DNR, abuse & neglect)

Module 2 - Airway

[OBJECTIVES: Cognitive - 3; Affective - 2; Psychomotor - 5]

I Opening the Airway
II Techniques of Suctioning

III Techniques of Artificial Resuscitation (Mouth-to-mask, 2 person B-V-M, flow restricted, oxygen powered ventilation device [demand valve], 1 person B-V-M
IV Airway Adjuncts (Oral & Nasal Airways)

V Oxygen (Non-rebreather masks & Nasal Cannulas)

Module 3 - Patient Assessment

[OBJECTIVES: Cognitive - 14; Affective - 3; Psychomotor - 7]

I Scene Size-up/Assessment
II Initial Assessment
III Focused History & Physical Examination
IV Detailed Physical Exam
V Ongoing Assessment
VI Verbal Report
VII Interpersonal Communication
VIII Prehospital Care Report

Module 4 - Medical/Behavioral

[OBJECTIVES: Cognitive - 7; Affective - 2; Psychomotor - 3]

I General Pharmacology
II Breathing Difficulty (Signs & Symptoms, Emergency Medical Care, Medications)
III Cardiac Emergencies (Signs & Symptoms, Emergency Medical Care, Medications, S/AED)
IV Altered Mental Status
V Care of Diabetic Emergencies
VI Allergic Reactions
VII Poisoning/Overdose
VIII Behavioral Emergencies

Module 5 - Trauma

[OBJECTIVES: Cognitive - 5; Affective - 3; Psychomotor - 5]

I Shock
II Open Chest Wound
III Open Abdominal Wound
IV Amputations
V Burns
VI Injuries to Bones & Joints
VII Head & Spine Injuries
VIII Rapid Extrication

Module 6 - Obstetrics, Infants & Children

[OBJECTIVES: Cognitive - 5; Affective - 2; Psychomotor - 3]

I Normal Delivery
II Abnormal Deliveries
III Medical Problems in Infants & Children
IV Trauma in Children

Module 7 - Operations*

[OBJECTIVES: Cognitive - ?; Affective - ?; Psychomotor - ?]

I Ambulance Operations

II Gaining Access
III Overviews (HAZ-MAT, Triage, MCI, Disaster Operations, Incident Management)

*Module 7 objectives should be integrated into Module 1. See Appendix pages A-32 through A-34 of DOT EMT-B Refresher curriculum

1994 CURRICULUM EMT-B REFRESHER COURSE - MINIMUM REQUIREMENTS

INSTRUCTIONAL METHOD SHEET: DOT EMT- BASIC REFRESHER COURSE

MODULE 1 - PREPARATORY

	Date	Start Time	End Time	Instructor & Credentials	Teaching Resources	Testing Tool
Scene safety						
Quality Improvement						
Health & Safety						
Medical - Legal						

MODULE 2 - AIRWAY

Opening the Airway						
Techniques of Suctioning						
Techniques of Artifical. Resus.						
Airway Adjuncts						
Oxygen						

MODULE 3 - PATIENT ASSESSMENT

Scene Size-up/Assessment						
Initial Assessment						
Focused History &						
Physical Examination						
Detailed Physical Exam						
Ongoing Assessment						
Verbal Report						
Interpersonal Communication						
Prehospital Care Report						

MODULE 4 - MEDICAL/BEHAVIORAL

General Pharmacology						
Breathing Difficulty						
Cardiac Emergencies						
Altered Mental Status						
Care of Diabetic						
Allergic Reactions						
Poisoning/Overdose						
Behavioral Emergencies						

1994 CURRICULUM EMT-B REFRESHER COURSE - MINIMUM REQUIREMENTS

INSTRUCTIONAL METHOD SHEET: DOT EMT- BASIC REFRESHER COURSE

MODULE 5 - TRAUMA

	Date	Start Time	End Time	Instructor & Credentials	Teaching Resources	Testing Tool
Shock						
Open Chest Wound						
Open Abdominal Injury						
Amputations						
Burns						
Injuries to Bones & Joints						
Head & Spine Injuries						
Rapid Extrication						

MODULE 6 - OBSTETRICS, INFANTS & CHILDREN

Normal Delivery						
Abnormal Deliveries						
Medical Problems in Infants & Children						
Trauma in Children						

MODULE 7 - OPERATIONS*

Ambulance Operations						
Gaining Access						
Overviews (HAZ-MAT, Triage, MCI, Disaster Operations, Incident Management)						

*N.B. - Module 7 should be incorporated into Module 1 whenever possible.

Emergency Medical Technician - Intermediate Refresher Requirements

In order for Massachusetts EMT-Intermediates to meet the minimum U.S. Department of Transportation (DOT) EMT-Intermediate Refresher requirements, an EMT-I must complete an EMT-Basic DOT Refresher Course (24 hours), along with a twelve (12) hour DOT EMT-Intermediate Add-on Refresher course. Sponsors may either offer a 36 hour long (combined EMT-Basic and an EMT-I Add-on Refresher) course, or separate EMT-Basic and EMT-I Add-on Refresher courses. If offered separately, each of these refreshers will need to be approved individually so that there will be an OEMS approval number for each refresher.

The minimum requirements for the DOT EMT-Intermediate Add-on refresher requirements are as follows:

- Roles and Responsibilities 1 hour
- Human Systems and Patient Assessment 3 hours
- Shock and Fluid Therapy 3 hours
- Respiratory System (EOA/EGTA and/or ET) 2 hours
- Communications 1 hour
- Testing (written & practical) 2 hours

The approval process for a 36 hour EMT-I Refresher requires the submission of a completed application and program outline that meets all of the minimum DOT EMT-Basic and EMT-I Add-on refresher requirements. Approval for an EMT-I Add-on Refresher requires the submission of an application and program outline that meets all of the minimum DOT EMT-Basic refresher requirements, and a second completed application and program outline that meets the minimum requirements for an EMT-I Add-on Refresher. The completed application(s) and outlines(s) must be submitted to the appropriate Regional Training Committee a minimum of six (6) weeks prior to the start date. In doing so, the following conditions must be met:

a. Complete an application for approval (OEMS Form 200-46) for the EMT-Basic refresher and the EMT-I Refresher courses. These may be submitted separately. When you conduct an Add-on Refresher by itself, remember, the EMT-Intermediates in attendance must also complete a DOT EMT- Basic Refresher.
b. Provide a program outline that meets the minimum EMT-Basic Refresher requirements and an outline that meets the minimum EMT-Intermediate Refresher requirements. Each outline must identify the dates and times of the refresher.
c. The EMT-I Add-on Refresher must have a Physician Medical Director to oversee the conduct of the program.
d. Provide a list of instructors along with their EMS credentials. All of the instructors must be, at a minimum, an EMT-Intermediate. The primary Instructor must also have some form of instructor credentials (e.g., CPR Instructor, BTLS instructor).
e. Provide a copy of the final written examination, along with the answer key.
f. Provide a copy of Practical Examination Skill Sheets.
g. If the Add-on Refresher is going to be combined with an EMT-Basic and/or an EMT-Paramedic refresher, the minimum requirements for each individual refresher must be met. (Refer to each curriculum)
h. Forward the program materials to the appropriate Regional Training Committee a minimum of six (6) weeks prior to the start of the program.

NOTE: ***If the 12 hr DOT EMT-Intermediate Add-on Refresher is part of a Paramedic Refresher, you must submit separate applications for the Intermediate and Paramedic refreshers. For example, the sponsor will need to apply for and receive an approval number for the 12 hour Add-on Refresher course and the Paramedic Refresher program..***

INTERMEDIATE ADD-ON REFRESHER REVIEW/CHECK LIST

1. Will the 12 hr EMT-Intermediate Add-on Refresher be combined with a 24 hour DOT EMT-Basic Refresher?

   Yes _____ No _____

   If yes, did you submit an application for approval for the Basic EMT refresher and the EMT-Intermediate Add-on refresher? Yes _____ No _____

2. Optional Curricula: Did you compare your program outlines against the DOT Basic and the EMT-Intermediate add-on refresher curriculums to determine that they individually and collectively meet the minimum DOT requirements?
   If you determine you have content deficiencies, you must revise the program outline(s).

3. Will this 12 hr DOT Intermediate Add-on Refresher be part of a Paramedic refresher?
   Yes ____ No ____

   If yes, did you compare your program outlines against the EMT-Intermediate add-on and EMT-Paramedic refresher curriculums to determine that they individually and collectively meet the minimum DOT requirements? If you determine you have content deficiencies, you must revise the program outline(s).

4. EMT-Intermediate Add-on refresher curriculum check list.

Mandatory Topics	Minimum hours
( ) Roles and Responsibilities	1
( ) Human Systems and Patient Assessment	3
( ) Shock and Fluid Therapy	3
( ) Respiratory System (includes EOA/EGTA and/or ET)	2
( ) Communications	1
( ) Testing (includes written & practical)	2

5. TESTING REQUIREMENTS

   ( ) Written: Test and Answer Key
   ( ) Practical: Skill Sheets

OTHER APPLICATION REQUIREMENTS

( ) Program outline identifying the dates, topics and times
( ) Physician Medical Director
( ) List of instructors along with their credentials
( ) Copy of Written Examination, including the answer key
( ) Copy of Practical Examination Skill Sheets
( ) If combined with other refreshers; verify that each of the refreshers meets the minimum DOT refresher requirements.

NOTE: ***If the 12 hr DOT EMT-Intermediate Refresher is part of a Paramedic Refresher, Intermediates must cover one (1) hour of Roles & Responsibilities, three (3) hours of Human Systems & Patient Assessment and one (1) hour of communications that is not required for paramedics. If your program outline does not meet these minimum requirements, you will need to revise the program outline.***

Emergency Medical Technician -Paramedic Refresher Requirements

All Massachusetts and National Registry EMT-Paramedics must complete a biennial forty-eight (48) hour refresher course. Ensure your course meets the most current version of the U.S. Department of Transportation (DOT) National Standard Curriculum for EMT-Paramedic Refresher.

The refresher must cover each topic listed in the content checklist and meet the minimum time frame established for each topic. When the minimum required time frame for each topic is covered, it will consist of thirty-six (36) hours of content. This allows the program sponsor to dedicate the balance (12 hours) to cover certain areas of the refresher in greater depth, based upon the department's needs assessment, or to address other topics and/or procedures not identified in the refresher curriculum.

Note: ***Ensure the Pediatric Curriculum requirements are met, see enclosure #1 for instructions at end of this manual..***

If an EMT-Intermediate 12 hour DOT Add-on refresher will be integrated into the paramedic refresher, it will be necessary for the program sponsor to make sure that the refresher will cover the minimum refresher requirements for both refresher curricula. It is important to recognize the fact that the EMT-Intermediate refresher requirements mandate specific topics that are not required in the EMT-Paramedic refresher curriculum. The EMT-Intermediate refresher requires the following topics and minimum time frames: one (1) hour of Roles & Responsibilities, three (3) hours of Human Systems & Patient Assessment and one (1) hour of Communications. Please refer to both refresher curricula for further information.

The Approval process for an EMT-Paramedic refresher requires the submission of a completed application and program outline that meets all of the minimum DOT EMT-Paramedic refresher requirements to the appropriate Regional Training Committee a minimum of six (6) weeks prior to the start date. In doing so, the following conditions must be met:

a. Complete an application for approval (OEMS Form 200-46) for the EMT-Paramedic refresher course.
b. Provide a program outline that meets the minimum EMT-Paramedic Refresher curriculum requirements.
c. The EMT-Paramedic refresher must have a Physician Medical Director to oversee the operation of the program.
d. Provide a list of instructors along with their EMS credentials. All of the instructors must be at a minimum, an EMT-Paramedic. The primary Instructor must also have some form of instructor credentials (i.e., CPR Instructor, BTLS instructor, etc.).
e. Provide a copy of the final written examination, along with the answer key.
f. Provide a copy of Practical Examination Skill Sheets.
g. If the Add-on refresher is going to be combined with an EMT-Basic and/or an EMT-Paramedic refresher, the minimum requirements for each individual refresher must be met. (Refer to each curriculum)
h. Forward the program materials to the appropriate Regional Training Committee a minimum of six (6) weeks prior to the start of the program.

REMINDER: If the 12 hr DOT EMT-Intermediate Refresher is part of a Paramedic Refresher, Intermediates must cover one (1) hour of Roles & Responsibilities, three (3) hours of Human Systems & Patient Assessment and one (1) hour of Communications that is not a mandatory requirement for paramedics. If your program outline does not meet these minimum requirements, you will need to revise the program outline.

NOTE: EMT-Intermediates attending the EMT-I Add-on Refresher must also complete a 24 hour DOT EMT-Basic refresher, if not done so already.

PARAMEDIC REFRESHER CONTENT CHECK LIST

The purpose of this check list is to assist the program coordinator. Make sure that all of the necessary topics are being covered prior to submitting the application for approval.

Deficiencies	OEMS/DOT Requirement (hours)	Your Program (hours)	Program (hours)
DIVISION I PREHOSPITAL ENVIRONMENT	none	_____	_____
DIVISION II PREPARATORY			
Section 1 General Pt. Assessment	1 - 2	_____	_____
Section 2 Airway Management	2 - 4	_____	_____
Section 3 Shock	1 - 3	_____	_____
Section 4 General Pharmacology	4 - 8	_____	_____
DIVISION III TRAUMA			
Section 1 Trauma Assessment	1 - 3	_____	_____
Section 2 Injuries to CNS	2 - 4	_____	_____
Section 3 Thoracoabdominal Trauma	2 - 5	_____	_____
Section 4 Burns	1 - 3	_____	_____
DIVISION IV MEDICAL EMERGENCIES			
Section 1 Assessment/Medical	1 - 3	_____	_____
Section 2 Respiratory System	2 - 4	_____	_____
Section 3 Cardiovascular System	5 - 10	_____	_____
Section 4 Nervous System	1 - 3	_____	_____
Section 5 Endocrine System	1 - 2	_____	_____
Section 6 Communicable Disease	1 - 2	_____	_____
Section 7 Toxicology, Alcohol, Drug Abuse	1 - 3	_____	_____
Section 8 Environmental Emergencies	2 - 4	_____	_____
Section 9 Special Considerations for Geriatric & Pediatric Pts.	1 - 3	_____	_____
Note: Pediatric Refesher Requirements are located in encloser #1 at the end of this document			
DIVISION V OB/GYN/NEONATAL			
Section 1 Gynecological Problems	1	_____	_____
Section 2 Obstetrics & OB Complications	1 - 2	_____	_____
Section 3 Care of the Neonate	1 - 2	_____	_____
DIVISION VI BEHAVIORAL EMERGENCIES			
Section 1 Overview of Behavioral Emergencies	1	_____	_____
Section 2 Psychotic Disorders	1 - 2	_____	_____
Section 3 The Violent Patient	1	_____	_____
Section 4 Response to the Crisis Situation	1	_____	_____
TESTING: Written & practical	2	_____	_____
Minimum Requirement	**48 hours**	_____	_____

Paramedic Refresher Instructor List

	Instructor (name)	Title*
DIVISION I PREHOSPITAL ENVIRONMENT		
DIVISION II PREPARATORY		
Section 1 General Pt. Assessment		
Section 2 Airway Management		
Section 3 Shock		
Section 4 General Pharmacology		
DIVISION III TRAUMA		
Section 1 Trauma Assessment		
Section 2 Injuries to CNS		
Section 3 Thoracoabdominal Trauma		
Section 4 Burns		
DIVISION IV MEDICAL EMERGENCIES		
Section 1 Assessment/Medical		
Section 2 Respiratory System		
Section 3 Cardiovascular System		
Section 4 Nervous System		
Section 5 Endocrine System		
Section 6 Communicable Disease		
Section 7 Toxicology, Alcohol, Drug Abuse		
Section 8 Environmental Emergencies		
Section 9 Special Considerations for Geriatric & Pediatric Pts		
DIVISION V OB/GYN/NEONATAL		
Section 1 Gynecological Problems		
Section 2 Obstetrics & OB Complications		
Section 3 Care of the Neonate		
DIVISION VI BEHAVIORAL EMERGENCIES		
Section 1 Overview of Emergencies		
Section 2 Psychotic Disorders		
Section 3 The Violent Patient		
Section 4 Response to the Crisis Situation		

*Title/Credentials

- Physician (MD)
- Physician Assistant (PA)
- Nurse Practitioner (NP)
- Registered Nurse (RN)
- Respiratory Therapist (RT)
- Paramedic (EMT-P)
- Other... (please list & explain)

[Instructors may also list other credentials (e.g. ACLS, ATLS, PHTLS, BTLS, BLS-CPR Instructor, etc.]

Chapter IV
How to Submit Special Programs for Continuing Education Credit Hours

OEMS will award Continuing Education Credit Hours to EMT's at all levels for programs that are related to the Role and Responsibility of an Emergency Medical Technician, but which do not have an approval number as described previously in this manual. Examples include:

• Childbirth Preparation Classes (4 hr. max.) & participating in a Childbirth (4 hr. max.)

A letter or certificate of completion for the class, and/or a letter confirming attendance at the birth will act as supporting documentation.

• College Level courses (e.g., Anatomy & Physiology, Human Development, Nursing, etc.)

A course syllabus (lesson plan outline, schedule, etc.) along with a transcript showing successful completion will confirm eligibility.

• National/State EMS Seminars

Seminars such as EMS Today, Emergency Cardiac Care Conference, EMS Expo, and ClinCon may be awarded EMT continuing education credit. Submission of course syllabus or outline and certificate of attendance will confirm eligibility.

• Publishing an Article in an EMS Journal

An EMT may receive special credit by writing a published article for a trade or professional journal such as JEMS, Emergency, Rescue, etc. A copy of the article and a cover letter requesting specific credit hours should be submitted to OEMS. Credit will be awarded based on content.

• Credit hours for teaching EMS related programs

Authorized instructors who teach EMS related subjects (CPR, first aid, first responder training, etc.) or who assist with the practical instruction in the Basic EMT Course may earn up to a maximum of 20 hours credit toward recertification during the two year recertification period.

An EMT earns one hour of credit for each two hours of unassisted teaching or practical assistance he/she does. OEMS awards credits for CPR teaching as follows (BLS-CPR course = 4 credit hours; CPR refresher course = 3 credit hours). Co-instructors split credit hours.

Special credit hours are awarded on an individual basis after review by OEMS. An individual requesting special credit must furnish OEMS with materials that support their request for credit. For specific details on receiving special credit hours call OEMS at 617-284-8300.

Chapter V
How to Evaluate Your Instructors and Programs

How do you know if the program you sponsored had a positive effect on the EMTs who participated? How do you know if your instructor was clearly understood by the students? How do you know if the students have "learned" anything as a result of your program?

One way is by evaluation or testing. Except in Refresher Programs, testing is not required in a continuing education course, but may be a very effective tool to evaluate whether your program changed the behavior of the students, i.e., did they "learn"?

NOTE:

Another way to evaluate your program is to have the students complete an **Instructor Evaluation Form** and **Program Evaluation Form** immediately following the course. These forms should provide you with feedback that can be used to improve both your program and program instruction. Instructors should develop specific evaluation forms for each program or class they present. Student evaluation of a skill presentation differs from a lecture.

Finally, you may learn something by having another experienced instructor evaluate the performance of the course instructor.

OEMS Course Monitoring

To ensure quality programs in the Commonwealth of Massachusetts, staff from the Office of Emergency Medical Services, the Regional EMS Councils, or other designated personnel may monitor one of your courses. MDPH/OEMS is authorized to monitor any EMS Training Program (see 105 CMR 170.000 *et seq*.).

If OEMS decides to make a site visit to one of your programs, the OEMS representative will be evaluating the program based on information forwarded to OEMS in the Program Outline. It is important for the course sponsor to notify OEMS of any change(s) from the original course application, such as a date or time change, or a faculty change, in advance.

If the OEMS representative notes a deficiency in the course content or hours, the actions to be taken by OEMS may include:

1. An opportunity to remediate problems identified on the site visit.
2. Notification of appropriate Regional Office Training Committees.
3. Further action (modification of approved hours, revocation of approval, written corrective action plan, etc.) may occur as needed.

Any questions regarding on-site course monitoring can be directed to OEMS.

Chapter VI
General Responsibilities Of Instructor Personnel

The Program Coordinator has the ultimate responsibility for all aspects of the course including

planning, developing, instruction and coordinating to State regulations and the standards outlined in this manual.

- CURRENT KNOWLEDGE: The Program Coordinator will remain current and up-to-date regarding all procedures, equipment, texts, laws and regulations pertaining to the provisions of prehospital care and the role and responsibility of the EMT.

- RESPONSIBILITY FOR EACH LESSON: Regardless of who delivers a given lesson, whether lecture or practical demonstration, the Program Coordinator is responsible for the conduct of that lesson. This includes physician and other specialty lectures where the Program Coordinator will ensure that the material presented is appropriate and delivered at a level of comprehension suitable to the student. Responsibility for the lesson includes ensuring appropriateness of all equipment and supplies regardless of who utilizes them. The Program Coordinator is responsible for ensuring that all students are taught the required subject matter, are objectively evaluated, and if necessary remediation.

- RESPONSIBILITY OF PRIMARY INSTRUCTOR: The Primary Instructor will be knowledgeable in all aspects of prehospital emergency care, in the techniques and methods of adult education, and managing resources and personnel. This individual shall have completed the required prerequisite (attended and successfully completed a program in EMS instructional methodology and an update on this curriculum) and be fluent in the format, philosophy and skills of the curriculum being presented. The primary instructor shall be present for most, if not all, class sessions to assure program continuity.

- RESPONSIBILITY OF ASSISTANT INSTRUCTOR/AIDE: Assistant Instructor/Aides shall be current, Massachusetts certified Emergency Medical Technicians at the Basic level or above. Every Assistant Instructor/Aide shall have expertise in skills demonstration and evaluation. The Assistant Instructor/Aide needs to be familiar with the operation and maintenance of all equipment in their areas of instruction and must be fully knowledgeable in the lesson requirements. The Primary Instructor and or Program Coordinator is responsible for orientation of Assistant Instructor/Aide prior to class. The Assistant Instructor/Aide will normally be acting as the instructor for small groups and must present material that is correct and consistent with what is taught by the Primary Instructor.

- MEDICAL SPECIALIST LECTURERS: For certain lessons, other medical qualified individuals versed in the prehospital application of skills may be utilized. It is the Program Coordinator's responsibility to ensure that the lecturers are familiar with the roles and responsibilities of EMTs in Massachusetts, and the material presented is consistent with current established standards.

APPENDIX A

Names and Addresses of Regional Councils / Regional Directors

REGION 1 - Western Mass

Linda Moriarty
Western Mass EMS

7 Deniston Place
Northampton, MA 01060

413-586-6065

REGION 2 - Central Mass

Edward McNamara
Central Mass EMS Corp.
361 Holden St.
Holden, MA 01520

508-854-0111

REGION 3 - Northeast Mass

Jonathan Epstein
Northeast EMS
16 Del Carmine St.
Wakefield, MA 01880

781-224-3344

REGION 4 - Metro Boston

Stephen Nelson
Metro Boston EMS Council
25 B Street, Suite A
Burlington, MA 01803

781-505-4367

REGION 5 -Southeast Mass

TBA

Encl;osure #1

This curriculum content will be a requirement for all EMT-Paramedic refresher courses in Massachusetts after January 1, 1999

This is a revision of Chapter 30 of the "Instructor's Resource Manual for Paramedic Emergency Care," by Richard Cherry, Director of the Paramedic Training Department, Department of Critical Care and Emergency Medicine, SUNY, Syracuse, published by Brady.

The revised content was selected and written by members of the Massachusetts Emergency Medical Services for Children (EMSC) Project Pediatric Resource Group. Questions and comments should be directed to Janet Berkenfield, EMSC Project Director, Mass. Dept of Public Health, (617) 624-5431.

Pediatric Emergencies (*Revised February 1998*)

LEARNING OBJECTIVES

1. Describe the typical child's emotional response to an emergency.
2. List appropriate developmental milestones for each age group of children and relate the appropriate approach to patient assessment.
3. Discuss the typical parent's response to a pediatric emergency.
4. Describe pediatric patient assessment.
5. Describe the role of non-invasive monitoring in prehospital pediatric emergency care.
6. Describe the concept of Pediatric Advanced Life Support (PALS).
7. Describe the modifications required for pediatric advanced life support, including drug dosage, endotracheal intubation, defibrillation, and IV therapy.

Objectives 1-7 should be considered as basic core objectives: 1 hour

For a 3-hour course, the instructor should choose from the following topics to complete the other 2 hours.

8. Discuss pediatric trauma emergencies and compare them to trauma emergencies seen in adult patients. **30 min.**

9. Describe the characteristics of the abused child and of the child abuser.
10. Describe signs and symptoms suggestive of child abuse or neglect.
11. List management techniques to use when treating an abused child.

Objectives 9-11: 15 min.

12. Discuss the pathophysiology, assessment and prehospital management of the following pediatric neurological emergencies: seizures, febrile seizures, meningitis. **30 min.**

13. Discuss the pathophysiology, assessment, and prehospital management of the following pediatric respiratory emergencies: aspirated foreign body, croup, epiglottitis, bronchiolitis, asthma, status asthmaticus. **30 min.**

14. Discuss the pathophysiology, assessment, and management of the following pediatric gastrointestinal emergencies: nausea and vomiting, diarrhea. **30 min.**

15. Discuss the pathophysiology, assessment, and prehospital management of the following pediatric cardiovascular emergencies: dehydration, sepsis, dysrhythmias, congenital heart disease. **30 min.**

16. Define Sudden Infant Death Syndrome (SIDS), the theories of etiology, and management in the prehospital setting. **15 min.**

17. Describe the population of children with special health care needs in Massachusetts. What are the major medical conditions these children experience, and how can EMS providers be prepared to care for children assisted by technology living or attending school in their community?
18. Describe some of the equipment these children might be using.
19. Demonstrate an understanding of the unique role played by the parents of children with special health care needs.

Objectives 17-19: 30 min.

20. Discuss the issues of emergency care for children in the school setting. **15 min.**

The first 7 objectives should always be included in any pediatric refresher for paramedics.
If the Instructor prefers to cover all of the above objectives (i.e. # 1-20), a 6-hour format should be used. If the Instructor is limited to, or prefers, a 3-hour format, s(he) can complete all of objectives 8-20 over several repetitions of the refresher course.

Teaching Outline	Notes
General Approach to Pediatric Emergencies • Varies with the age and nature of incident • Quick and specific questioning of the child • Key on your visual assessment; begin your examination without instruments • Approach the child slowly and gently • Do not separate the child from the mother unnecessarily • Be honest and allow the child to determine the order of the examination • Avoid touching painful areas until confidence has been achieved <u>The Child's Response to Emergencies</u> • Fear of being separated from parents • Fear of being removed from home • Fear of being hurt • Fear of mutilation • Fear of the unknown <u>General Guidelines</u> • Be honest with children • Tell them it will hurt, if it will • Use appropriate language	

Teaching Outline	Notes
Developmental Stages - A Key to Assessment Neonatal Stage • Birth to 1 month • Congenital problems and other illnesses often noted • Personality development begins • Stares at faces and smiles • Easily comforted by mother and sometimes father • Rarely febrile. If so, be cautious of meningitis • Approach -Keep child warm -Observe skin color, tone, respiratory activity -Absence of tears when crying indicates dehydration -Auscultate the lungs early when the child is quiet -Have the child suck on a pacifier -Have the child remain in the mother's lap Ages 1-5 Months • Birth weight doubles • Can follow movements with their eyes • Muscle control develops • History must be obtained from parents • Common illnesses -SIDS -Vomiting and diarrhea/dehydration -Meningitis -Child Abuse -Household injuries • Approach -Keep child warm and comfortable -Have child remain in mother's lap -Use a pacifier or bottle Ages 6-12 Months • Ability to stand or walk with assistance • Very active and explore their world with their mouths • Stranger anxiety • They do not like lying supine • They cling to their mothers • Common illnesses -Febrile seizures -Vomiting and diarrhea/dehydration -Bronchiolitis or croup -Auto-related injuries and falls -Child abuse - Ingestions and foreign body obstructions -Meningitis • Approach -Examine the child in the mother's lap -Progress from toe to head -Allow the child to get used to you	***Teaching Tip*** *Not all of your students feel comfortable around small children. Arrange for those who have no children of their own to spend time at a local day care center, just to be around kids of all ages. Another way is to have a lab where children of all age groups come and have their vital signs taken by the students.*
Teaching Outline	**Notes**

Developmental Stages (cont.)

Ages 1-3 Years

- Motor development, always on the move
- Language development
- Child begins to stray from mother
- Child can be asked certain questions
- Injuries prevail
- Common problems
  - -Auto-related injuries
  - -Vomiting and diarrhea
  - -Febrile seizures
  - -Croup, meningitis
  - -Foreign bodies
- Cautious approach to gain confidence
- Child may resist physical exam
- Avoid "no" answers
- Tell the child if something will hurt

Ages 3-5 Years

- Tremendous increase in motor development
- Language is almost perfect but may not wish to talk
- Afraid of monsters, strangers, fear of mutilation
- Look to parent for comfort and protection
- Common problems
  - -Croup, asthma, epiglottitis
  - -Ingestions, foreign bodies
  - -Auto-related injuries, burns
  - -Child abuse
  - -Drowning
  - -Meningitis, febrile seizures
- Interview child first, then have parents fill in gaps
- Use a doll or stuffed animal to assist in assessment
- Allow the child to hold and use equipment
- Allow them to sit on your lap
- Always explain what you are going to do

Ages 6-12 Years

- Active and carefree
- Great growth, clumsiness, personality changes
- Strive for their parents' attention
- Common problems
  - -Drowning
  - -Auto and bicycle-related injuries
  - -Fractures, falls, sports injuries
- Interview the child first
- Be honest, protect their privacy and tell them what is wrong
- They may cover up information if they were disobeying

Teaching Tip

Using the popular cartoon "Calvin and Hobbs" is a fun way to illustrate the fear of monsters common to this age group.

Teaching Outline	Notes

Developmental Stages (cont.) Ages 12-15 Years • Varied development • Concerned with body image and very independent • Peers are most important • Common problems -Mononucleosis -Auto-related injuries, sports injuries -Asthma -Drug and alcohol abuse -Sexual abuse, pregnancy -Suicide gestures • Interview child away from the parent • Pay attention to what they are not saying	
The Parents' Response to Emergencies • Expect a grief reaction • Initial guilt, fear, anger, denial, shock, loss of control Parent Management • Tell them your name and qualifications • Acknowledge their fears and concerns • Reassure them it is all right to feel as they do • Redirect their energies to help you care for the child • Remain calm and in control • Keep them informed as to what you are doing • Don't "talk down" to parents • Assure parents that everything is being done	
Teaching Outline	**Notes**
General Approach to Pediatric Assessment	

History • Be direct and specific with child • Focus on observed behavior • Focus on what child and parents say • Approach child gently, encourage cooperation • Get down to visual level of child • Use a soft voice and simple words Physical Exam • Assess patency of airway • Respirations -Observe the rate and pattern before the child starts crying -Is rate too slow or too fast? -Look for retractions, nasal flaring, paradoxical chest movement, grunting, and head bobbing • Pulse -Brachial, carotid, or radial depending on child -Monitor for 30 seconds -Compare central and peripheral pulses -Assess capillary refill • Blood pressure -Use the right size cuff • Brief neurological assessment -Mental status, interaction with known caretakers -Pupils: size and shape • Focused Physical Assessment • Non-Invasive Monitoring -Pulse oximetry -ECG monitoring -Automated blood pressure devices	

Developmental Anatomy and Physiology as Related to Critical Assessment

Organ System	Characteristic	Significance
Airway	Small mouth, large tongue	Tongue easily causes airway obstruction; control of tongue during intubation may be difficult.
	Small caliber of upper airway	Small changes in radius cause large increases in resistance.
	Larynx higher in neck and more anterior	"Sniffing" position is ideal position for visualizing cords. If neck is hyperextended, cords can't be seen.
	Narrowest portion of trachea is below the cords at the cricoid ring	Do not use cuffed tubes in children under 8 years.
	Epiglottis is "U" shaped and extends into pharynx	Use a straight blade to directly control the epiglottis during intubation.
Cervical Spine	Wedge-shaped vertebrae	Greater mobility
	Fulcrum of neck motion is higher (C5-6)	Injuries occur higher in C-spine (C1,2,3)
	Head is heavier	Greater stress on spinal cord in flexion-extension injuries
	Neck muscles not well developed	Greater risk for injury
Chest and Lungs	Compliant chest wall	Collapses with efforts to increase tidal volume, increasing the work of breathing
	Less alveolar surface area	Less area for gas exchange, less respiratory reserve
	Less glycogen stores in diaphragm	More prone to diaphragmatic fatigue
	Higher metabolic rate increases oxygen requirement	Increased minute ventilation to meet O2 requirement results in lower pCO2.
	No hypoxic drive	Infant becomes apneic in response to hypoxia.
	Small caliber of intrathoracic airways	Small decrease in radius results in much greater increase in resistance to flow (e.g. wheezing in bronchiolitis).

Developmental Anatomy and Physiology (cont.)

Organ System	Characteristic	Significance
Cardiovascular	Infant cannot increase stroke volume. Ability to peripherally vasoconstrict	Increase in cardiac output is achieved by increasing heart rate. Can maintain BP despite significant volume loss; decrease in BP is late sign of shock
Abdomen	Abdominal wall less muscular Internal organs larger in relation to size of abdominal cavity	Internal organs less protected More susceptible to internal organ injury with blunt trauma
Extremities	Bones are more compliant Growth plates	Different fracture types Fractures, not sprains

Teaching Outline	Notes
Pediatric Advanced Life Support <u>Anticipating cardiopulmonary arrest</u> • Normally not a sudden event • Progressive deterioration of cardiorespiratory function • Goal is to recognize and prevent arrest • Recognition by physical exam alone • Rapid cardiopulmonary assessment for: -Respiratory rate > 60 -Heart rate > 180 or < 80 (under 5 years) > 160 (over 5 years) -Respiratory distress, cyanosis -Trauma, burns -Altered level of consciousness -Seizures -Fever with petechiae <u>Rapid cardiopulmonary assessment</u> • Airway patency • Breathing -Rate Fast rates will tire Slow rates are ominous -Air entry Observe chest rise, breath sounds, stridor, wheezing -Mechanics Nasal flaring, accessory muscle use -Color Cyanosis is a late sign Peripheral cyanosis (toes) vs. central cyanosis (lips) -Pattern Irregular breathing, long pauses associated with cyanosis or bradycardia or effortless deep breathing • Circulation -Heart rate Tachycardia means arrest Bradycardia means impending arrest -BP Hypotension is a late sign Mild hypotension should be vigorously treated -Peripheral Presence of peripheral pulses Pulse pressure narrows as shock develops Loss of central pulses is an ominous sign Capillary refill >2 sec = poor perfusion -End-organ perfusion Changes in mental status, such as lethargy, inappropriate response to strangers, pain, or failure to recognize strangers indicates poor cerebral perfusion Urine output less than 1 ml/kg/hr indicates poor renal perfusion. Ask about number of diapers.	

Teaching Outline	Notes
Management of the Critically Ill Infant or Child Basic Life Support Pediatric Airway Management • Anatomical differences -Larynx higher in the neck -Vocal cords are short and concave -Cricoid ring is narrowest part -Tongue is larger • Endotracheal intubation considerations -More difficult to visualize the vocal cords -Size of tube is based on size of cricoid ring -Use uncuffed tubes -Monitor for dysrhythmias during attempt -Straight blade recommended • Other considerations -Avoid EOA, PTL, ETC airways -Avoid nasotracheal airways • Bag valve mask with no pop-off valve • Avoid demand valve resuscitators Vascular Access and Fluid Therapy • IV techniques same as adults • Scalp veins often used • Normal saline or lactated Ringer's • Intraosseous infusion -Comatose child under 5 years old -See skill sheet 30-1 • Fluid bolus -20 ml/kg over 10-20 minutes, repeated prn -Reassess child Medications • Correct hypoxia (oxygen) • Increase perfusion pressure during chest compressions and stimulate more forceful cardiac compressions (epinephrine 0.01 mg/kg) • Accelerate the heart rate (atropine 0.02 mg/kg) • Correct metabolic acidosis (Bicarbonate 1 mg/kg) • Suppress ventricular ectopy (lidocaine 1 mg/kg) Electrical Therapy • Initial defibrillation dose is 2 joules/kg • All subsequent shocks at 4 joules/kg	***Emphasize*** *Children are able to maintain normal blood pressure until they finally drop it suddenly.* ***Handouts*** *Stroup, CA: "Intraosseous Infusion," JEMS, May 1987.* ***Points of Interest*** *The best outcomes from cardiac arrest in infants occur if:* *1) Respiratory arrest only* *2) CPR is performed for less than 3-4 minutes* *3) Less than one or two epi's have been administered* *4) Less than 20 minutes in arrest* ***Videos*** *Washington EMS for Children, "Intraosseous Infusions"* *Emergency Medical Update - Intraosseous Infusions, Feb. 1991*

Teaching Outline	Notes
Pediatric Trauma Emergencies Background Head, face, and neck injuries • Children prone to head injuries • Be alert for signs of child abuse • Facial injuries common secondary to falls • Always assume a spinal injury with head injury Chest injuries • Isolated injuries uncommon; usually associated with abdominal injuries Abdominal injuries • Second most common cause of pediatric trauma deaths • Most result of blunt trauma • Liver and spleen are most commonly injured organ • Treat aggressively for shock in blunt abdominal injury Extremity injuries • Usually limited to fractures and lacerations • Most fractures are incomplete • Watch for growth plate injuries Burns • Second leading cause of pediatric deaths • Scald burns are most common • Rule of nine is different for children Assessment & Management • ABC's - including vascular access (2 large-bore short peripheral IVs) • Initial management of head, chest, abdomen and extremities injuries and how it relates to the ABCs • Keep child warm • Keep parents and child together as much as possible	***Emphasize*** *C-spine precautions in neutral position to maintain adequate airway protection.* *Predictable injury pattern based on mechanism, e.g. Waddel's Triad with pediatric vs. car.* *Assess airway and adequacy of ventilation* *Symptoms of spleen and liver injuries can appear hours after initial injury. A good history is important.* *Splint femur fractures (large amount of blood loss can occur from a femur fracture).* *Parents can provide comfort for their child and provide information regarding the history of the injury.* ** A child that does not recognize parents or is not easily comforted by the parents has signs of a head injury.* ***Reference:*** *Eichelberger, "Pediatric Emergencies, "Chapter 9*

Teaching Outline	Notes
Child Abuse and Neglect <u>Background</u> • Be aware of your state law and your responsibilities as a mandated reporter • Those at greater risk -Premature or twin infants -Child with special needs -Uncommunicative child • Characteristics of some abusive parents: -Low self esteem -Social isolation -Parent-child role reversal -Childhood history of abuse -Abnormal psychological reactivity -External locus of control -Substance abuse -Physical or psychoneurologic health problems • Sexual abuse -Short, focused history to assess extent of injuries and safety of environment -Can occur at any age -Perpetrator is usually in a position of authority over the child -The sexual activity has usually progressed over time -Avoid touching the child or disturbing the clothing -Examine genitalia only if serious injury is suspected (i.e. active bleeding) -Maintain the chain of evidence -Provide caring support <u>Assessment</u> • Signs of potential child abuse -Long bone fractures in a child not yet walking -Injuries in different stages of healing - Suspected abdominal injury in a young child, with inadequate history -Burns or bruises in recognizable patterns -Injuries inconsistent with assessment findings -Increased intracranial pressure/Shaken Baby Syndrome -Parent's history of events surrounding the injury changes during the interview -Delay in seeking medical care -Inappropriate response to severity of injury -Parent denies any knowledge of possible mechanism of injury -Previous involvement with child protective services	***Resources*** *Light, J. and Conner, L., "Child Abuse Calls," Emergency, 27(8):30-35, 1995.* *Beckerman, B., "Child Abuse... Answers to and Discussion of the Test Questions Presented in the March Case Review," Emergency Medical Services, 22(4):82-3, April 1993.* *Pike, K.M., "When a Child Cries: the EMT's Role in the Determination and Treatment of Child Abuse, "Emergency, 25(9):39-41, September 1993.*

Teaching Outline	Notes
Child Abuse and Neglect (cont.) Assessment (cont.) • Signs of potential child neglect -Malnutrition without physical cause -Unsanitary or unsafe housing -Unattended medical or dental problems -Poor hygiene -Inappropriate clothing for the weather -Abandonment -Lack of supervision -Educational neglect (frequent absences) • Indicators of Munchausen Syndrome by Proxy -Recurrent illnesses with no identified cause -Unusual symptoms that don't make clinical sense -Symptoms that are only observed by parent -Frequent visits to various hospitals with normal findings -Presence of drugs that induced symptoms in a toxic screen -Discrepancies between history and physical findings -Numerous hospitalizations at different hospitals -Perpetrator is usually the mother who has some allied health training Management • Assess and maintain airway, breathing, and circulation • Assess potential disability • Perform secondary survey • Treat all injuries appropriately • Protect the child from further abuse • Notify the proper authorities; be familiar with your state reporting laws • Be objective, supportive and non-judgmental toward the parents • Transport the child to an appropriate emergency facility and give a complete report to the receiving care provider	

Teaching Outline	Notes
Pediatric Seizures Background Pediatric seizures can be either symptomatic of an underlying problem or idiopathic in origin. Seizures may be associated with the following conditions: • Fever • Idiopathic epilepsy • Electrolyte disturbances • Head trauma • Hypoglycemia • Toxic ingestions or exposure • Birth injury • CNS malformations • Sepsis • Neoplasms • Hypoxic-ischemic injury • Post trauma **Status Epilepticus** is seizure activity lasting longer than 30 minutes without recovery or when 3 or more seizures have occurred without wakening. **It is considered a medical emergency.** **Simple febrile seizures** occur in children 6 months to 5 years of age and result from a sudden increase in body temperature. They are brief, generalized seizures and never last more than approximately 20 minutes. They are usually related to a recent onset of URI symptoms or fever. Pathophysiology Seizures are paroxysmal electrical discharges of neurons in the brain resulting in alteration of function or behavior (APLS). They may be partial (focal) or generalized. Complications include cerebral damage secondary to hypoxia, arrythmias, or cardiac arrest. Assessment • Assess ABCs • Assess LOC • Vital signs with temperature • Describe nature of seizures (focal vs. generalized) • Any PMH of seizures, recent trauma, acute illness including diarrhea and/or vomiting • Does child take seizure medication? Amount and time of last dose • Identify patient with status epilepticus	***Resources*** *APLS (Hopkins), Practical Guide to Pediatric Intensive Care, 3rd ed. (Blumer)*

Teaching Outline	Notes
Management • Establish access • Manage the ABCs • Protect from further injury • Administer medications, as per medical control • Monitor ABCs with drug administration • Correct hypoglycemia • Transport to ED • D-stick • Initiate ALS standing orders	***Handout*** *Crabb, T.J., "In the Hot Seat: Managing Febrile Seizures," JEMS, January, 1993* **Drugs** **Dextrose:** 10% .5 gm/kg IV bolus

Teaching Outline	Notes
Meningitis Background • Infection of the meninges • Can result from virus or bacteria • More common in children • Infection can be fatal if not recognized and treated Assessment • Child may appear very ill • History of recent illness • High fever, lethargy, irritability • Bulging fontanelles in infants Management • ABCs • Assess for compensated shock or shock, and treat with IV fluids, 20cc/kg bolus • Mask for paramedics exposed for any suspected cases	***Emphasize*** *A child that cannot be consoled by parent and has a high-pitched cry is showing signs of irritation of the meninges.* ***Handout*** *Signs and Symptoms of Meningitis by Age*

Teaching Outline	Notes
Sepsis <u>Background & Pathophysiology</u> • Life-threatening bacterial infection of the bloodstream • Neonates highly susceptible to sepsis • Toxins released into bloodstream <u>Assessment</u> • Ill appearing child • Irritability or altered mental status • Fever • Vomiting and diarrhea • Cyanosis, pallor, mottled skin • Poor feeding • Petechiae <u>Management</u> • Support airway, breathing, circulation (ABCs) • Evaluate and treat signs of septic shock, IV fluids 20cc/kg • Initiate ALS protocols for pediatric shock • Contact medical control for additional medications (e.g. vasopressors)	***Emphasize*** **** Septic shock*** *Very ill appearance* *Altered mental status* *Tachycardia* *Capillary refill time > 2 seconds* *Hyperventilation leading to respiratory failure* *Cool and clammy skin* *Inability of child to recognize parents*

Teaching Outline	Notes
Aspirated Foreign Body Background • Usually the 1-5 year old age group • These kids put everything into their months • Accompanied by running or falling • Inadequate chewing capabilities • Common items: gum, hot dogs, peanuts, balloons, hard candy, small toys, jewelry Pathophysiology • Object may act as one-way valve allowing air in but not out • Partial obstruction is most effectively cleared by the patient's own mechanism • Object can be aspirated directly into lungs without upper airway obstruction Assessment • Complete obstruction will present as apnea • Partial obstruction may present as labored breathing, retractions, and cyanosis, stridor, apprehension, drooling • Signs of decompensated partial obstruction -Cyanosis -Bradycardia -Fatigue Management of Complete Obstruction & Partial Decompensated Obstruction • Attempt to clear airway with BLS techniques • Attempt removal with direct laryngoscopy and Magill forceps • Intubation; if necessary, needle cricothyrotomy • Management of partial obstruction -Make child comfortable -Administer humidified oxygen -Encourage child to cough -Have intubation equipment available -Transport to hospital for removal with bronchoscopy	***Points of Interest*** *90% of all deaths due to foreign body aspiration occur in patients < 5 years of age; 65% of these are infants.* ***Emphasize*** *Suspect FBO in all cases of sudden onset of respiratory distress with associated stridor, gagging, or coughing.*

Teaching Outline	Notes
Croup Background • Laryngotracheobronchitis • Viral infection of the upper airway • Occurs in ages 6 months to 4 years • More prevalent in fall and winter Pathophysiology • Edema develops, narrowing the airway lumen • Narrowing is subglottic • Severe cases may result in complete obstruction Assessment • Harsh, barking cough develops • Inspiratory stridor • Position of comfort is sitting • Nasal flaring, tracheal tugging, retractions • Never use a tongue depressor to examine the throat Management • Place child in position of comfort • Administer humidified oxygen • Administer nebulized epinephrine if severe attack	

Teaching Outline	Notes
Epiglottitis Background • Bacterial infection largely prevented by Hib vaccine • Used to occur in toddler and early school-age group; now occurs more often in adolescents and young adults Pathophysiology • Soft tissue, supraglottic infection • Resembles symptoms of upper airway obstruction Assessment • Sudden onset of symptoms with high fever • Child is drooling • Suprasternal retractions, shallow breathing, dyspnea, inspiratory stridor • Never try to use a tongue depressor to visualize the throat Management • Position of comfort is sitting forward • Administer humidified oxygen • If total obstruction occurs, ventilate with high pressure • Have intubation equipment available • Transtracheal ventilation may be required	***Emphasize*** *Since obstruction is supraglottic and involves soft tissue, positive pressure ventilation with Bag-Valve Mask is often successful.*
Bronchiolitis Background • Respiratory infection of the lower airways caused by Respiratory Syncitial Virus (RSV) • Occurs in infancy Pathophysiology • Lower airway obstruction is caused by smooth muscle constriction, lining edema, mucous production, and sloughing of cells from lining. • Compensatory mechanisms may increase the work of breathing, leading to fatigue (cross-reference/dev.anat.) Assessment • Copious nasal secretions • Cough, tachypnea, retractions • Expiratory wheezes and inspiratory rales Management • Place in position of comfort • Administer humidified oxygen by mask • Treat bronchospasm with albuterol • Support ventilations as necessary	***Videos*** ** Washington EMSC, R. Ward, "To Breathe, To Live."* ** Washington EMSC, "Respiratory Distress in Infants and Children."* ** Emergency Medical Update: Pediatric Respiratory Emergencies, Jan. 1990* ***Emphasize*** *Observation of degree of respiratory distress and respiratory pattern may be the best indicator of lower airway obstruction. The expiratory phase of respiration will be greater or equal to the inspiratory phase.* ***Remember:*** *Once the child is crying, you will not be able to assess lung findings in expiration.*

Teaching Outline	Notes
Asthma Background • Increasing in numbers and severity Pathophysiology • Triggers include allergens, viral infections, exercise, and change in weather • Airway obstruction from bronchospasm, mucosal edema and secretions • Airways may become plugged by thick mucous • Hyperinflation of the lungs, air trapping in alveoli • Less gas exchange --> hypoxemia, hypercarbia • Unconsciousness and death may ensue Assessment • Prior history of hospital admissions • Current home management • Child sitting up leaning forward • Spasmodic cough, tachypneic • Accessory muscle use • Breath sounds may be decreased or asymmetric • With poor air movement, wheezing may be absent Management • Administer supplemental oxygen • Treat bronchospasm -nebulized Albuterol -subcutaneous Epinephrine 1:1,000 0.01mg/kg SC • Administer supplemental oxygen • Prepare to support ventilation if patient decompensates Status asthmaticus • Severe prolonged asthma attack • Cannot be broken with repeated doses of epinephrine • Serious medical emergency • Greatly distended chest, absent breath sounds • Exhaustion, acidosis, dehydrated • Prepare for respiratory arrest	***Resource*** *National Heart and Lung Institute Guidelines* ***Note*** *Observation of degree of respiratory distress and respiratory pattern may be the best indicator of lower airway obstruction. The expiratory phase of respiration will be greater or equal to the inspiratory phase.* ***Remember:*** *Once the child is crying, you will not be able to assess lung findings in expiration*

Teaching Outline	Notes
Gastrointestinal Emergencies Background • Serious gastrointestinal bleeding occurs infrequently in otherwise healthy children. • Causes of abdominal pain that are not primarily gastrointestinal in origin include strep pharyngitis, urinary tract infections and basilar pneumonia. • Vomiting, particularly without diarrhea, can be caused by increased intracranial pressure, strep pharyngitis, coughing or urinary tract infections. Pathophysiology • Bowel obstruction, which can be manifested by vomiting and abdominal pain, can cause significant hypovolemia as a result of loss of luid into the obstructed loop of bowel. • Bowel obstruction can interfere with the blood supply to the intestines resulting in infarction of the bowel. • Catastrophic small bowel obstruction can occur secondary to volvulus. In this situation the bowel is floating in the abdominal cavity rather than being anchored to the abdominal wall in a condition known as malrotation. Any child with bilious vomiting and abdominal pain may have a malrotation with volvus. • Bilious vomiting in the newborn is a surgical emergency. Assessment • Identify by history the child with gastrointestinal bleeding (vomiting blood or coffee grounds, blood per rectum) or possible obstruction (bilious vomiting, abdominal pain). • Assess volume status by heart rate, quality of pulses, capillary refill, extremity temperature, mental status, urine output. • Identify the child who requires fluid resuscitation: - tachycardia - capillary refill > 2 seconds - thready distal pulse - lethargy - poor urine output Management • Establish vascular access as needed. • IV fluid, normal saline, 20 cc/kg bolus infused rapidly over 10-15 minutes. • Reassess heart rate, pulses, capillary refill, mental status and determine the need for additional fluid.	

Teaching Outline	Notes
Dehydration Background • Can occur more rapidly in children who have a higher percentage of body water. • There are multiple etiologies for the fluid loss which results in dehydration: - diarrhea and/or vomiting - fever - inadequate oral intake, which may be due to vomiting, respiratory distress - osmotic diuresis, usually secondary to hyperglycemia in diabetic ketoacidosis - burns Pathophysiology • Dehydration results in decreased intravascular volume and therefore poor cardiac output and inadequate perfusion of vital end organs. • Children respond to decreased cardiac output primarily by increasing heart rate (rather than stroke volume). Tachycardia is therefore a very sensitive sign of significant dehydration. • Decreased peripheral pulses occur with peripheral vasoconstriction designed to shunt blood toward more essential organs (heart, brain, kidneys). • Other symptoms of severe dehydration are the result of inadequate perfusion of end organs: - skin: poor capillary refill, decreased temperature - brain: lethargy - kidneys: decreased urine output • Fever and tachypnea significantly increase fluid requirements. Assessment • Determine sources of fluid loss by history. • Using the signs noted above, assess the child's volume status. Management • If any of the abnormalities noted above are present (tachycardia, poor distal pulses, prolonged capillary refill, lethargy), establish vascular access. • IV fluid, normal saline. Give 20 cc/kg over 10-15 min. • Reassess heart rate, distal pulses, capillary refill and mental status and determine the need for additional fluid.	

Teaching Outline	Notes
Cardiovascular Emergencies Background The child with a cardiac emergency can present with a variety of signs and symptoms reflecting hypoxia, heart failure, poor cardiac output. The most common dysrhythmia in children is bradycardia. Congenital heart disease (CHD) includes a variety of structural cardiac defects that present at birth, or shortly after, and are the primary cause of heart disease in children. **Other causes** of cardiovascular dysfunction may be due to: -drug toxicity -ingestion -blunt trauma -increased ICP Pathophysiology • **Dysrhythmias** are usually considered as either stable or unstable, fast or slow. • **Bradycardia** in unstable patients is usually due to hypoxemia and acidosis related to severe respiratory failure, hypothermia, or increased ICP from head trauma. • **Tachyarrhythmias**, >180-190 in the unstable patient is due to SVT or VT. The rate of SVT is >220. • **V-Fib** is extremely rare in children. • **Sinus Tachycardia** in the *stable* child is not considered a tachyarrhythmia and may be related to hyperthermia, hypovolemia. • **Sinus Bradyarrhythmia** in the *stable* child may be related to underlying cardiac disease, surgery, or cardiovascular fitness. Assessment • Evaluate ABCs • Note heart rate and rhythm • Assess color and perfusion • Assess temperature • Assess lung sounds for wheezing, rales • Assess mental status • What medications are taken? • ? PMH for CHD or recent cardiac surgery • Ingestions • Evaluate recent I's and O's	***Resources*** *APLS (Hopkins)*

Teaching Outline	Notes
Management • ABCs, supplemental O2 • Establish IV access • **Bradyarrhythmias (unstable)**: -Ensure adequate ventilation and oxygenation -Warm patient -CPR (if HR < 60 in infant or child) -Initiate ALS standing orders -Contact medical control for additional orders • **SVT or VT with pulse:** -Initiate ALS standing orders -Contact medical control for: 1) additional fluid boluses 2) synchronized cardioversion 3) adenosine • **Ventricular fibrillation or pulseless VT:** -Initiate ALS standing orders -Contact medical control for additional fluid boluses, sodium bicarbonate	

Teaching Outline	Notes
Sudden Infant Death Syndrome <u>Background</u> • Occurs during first year of life, with a peak at 2-4 months, especially in babies with low birth weights • Etiology is unknown - confirmation of SIDS is by autopsy • Causes 1.2 deaths per 1,000 births in US • Death occurs during sleep • Higher incidence during winter months • Higher incidence in crowded living conditions • Recent reduction in frequency, due to recommendations of position change for sleeping infants and increased frequency of full post mortem exams including death scene investigation <u>Assessment</u> • Cardiorespiratory arrest occurs during sleep • Normal state of nutrition and hydration • Mottled, pooled skin • Frothy, pink fluids around mouth and nose • Occasionally emesis present • Scene survey can provide critical information for future use <u>Management</u> • Initiate PALS guidelines for establishment of airway, providing artificial breathing and supporting artificial circulation • Assign one person, when possible, to explain procedures to parents • Encourage parents to see their baby • If death is pronounced in the field, notify the medical examiner • Notify your local (or the national) SIDS Center, so they can assist the parents and provide follow up grief counseling	***Videos*** *"First Responders to SIDS: You Make a Difference." Saddleback College, Media Production, Irvine, CA, 1992 (38 min.)* *"SIDS: A Special Report." Princeton, NJ, Films for the Humanities and Sciences; a production of the Idea Factory, 1997.* ***Other Resources*** *Vance, R. "Inroads: Making a Difference with SIDS... Sudden Infant Death Syndrome, " JEMS, 20(11):87, November 1995*

Teaching Outline	Notes
Care of the Child With Special Health Care Needs Background • Children with special health care needs are successfully living at home and attending school. • This group of children may or may not be dependent on medical technology. Some have conditions and needs that are recognizable at a glance; some do not. • Parents/caregivers are in most cases extremely knowledgeable about their child's condition, what is normal for that child and what is not. • EMS may be called if there is a problem with the child's equipment or technology. The call may be to the home or the school. • The Mass. Dept. of Public Health's goal is that every child dependent on technology have a well developed and coordinated Emergency Response Plan (ERP) in place. The ERP should include EMS, as well as primary and specialty care providers and school personnel if the child is old enough to attend school. • School nurses may contact EMS providers in their area regarding plans for children with special needs attending their school. • If there is no ERP in place, EMS providers can play a critical role in encouraging parents/caregivers to develop a plan with their primary care provider. • The most common emergencies are related to a critical airway (tracheostomy) or respirator dependence. Management • EMS should know about children with special needs living or attending school in their service area ***before*** an emergency occurs. Often children are in schools or daycare outside their home community. • Upon arrival, look to parent(s) or caregiver(s) for critical information about the child. • Be prepared to deal with the child's technology (e.g. a clogged trach tube) if necessary. • The appropriate point-of-entry hospital for the child may not be the closest hospital. • Does the child have a DNR order?	***Teaching Tip*** *The instructor should arrange to have portable equipment items available for students to look at (e.g. pediatric trach tubes).* *For assistance with this topic, contact the MASSTAR Program at MDPH, Div. for Children with Special Health Care Needs, (617) 624-5070.* ***Other Resources*** ***Articles*** *Palfrey, J. et al. "Prevalence or Medical Technology Assistance Among Children in Massachusetts in 1987 and 1990," Public Health Reports, March-April 1994.* *Newacheck, PW, and WR Taylor, "Childhood Chronic Illness: Prevalence, Severity, and Impact," American Journal of Public Health, March 1992.* *Wertz, EM, "The Special Needs Pediatric Patient," Emergency Medical Services, March 1993.* *SKIP - "Special Kids Information Program" Packet, New Hampshire EMSC Program. Includes written materials and slides. Contact NERA (address & tel.number above).* *"Children with Special Health Care Needs; Technology Assisted Children," 1998, Utah EMSC, EMSC Clearinghouse (703) 902-1203.*

Teaching Outline	Notes
Emergency Care in the School Setting Background • EMS can be called to a school if the nurse needs assistance or if the nurse is covering another school when the emergency occurs. • Other school personnel may or may not be trained in first aid and CPR. • School RNs are increasingly well trained in emergency care assessment. • School RNs are now equipped with epi-pens. • School RNs are developing emergency plans for their schools, which should include outreach to their EMS providers. • The potential for an emergency in the school has risen in recent years due to an increase in: -students with psychological emergencies; -students with substance abuse problems; -high risk pregnant teens; -students sent to school ill by working parents; -mainstreaming of children with special health care needs -children without a primary care provider; and -the ratio of the number of students / number of nurses Management • EMS providers should be encouraged to get to know school RNs and the emergency care resources available or unavailable to them. • EMS providers should have and be acquainted with a plan of the school layout. • There should be an awareness by EMS of high risk children enrolled in the schools, including children with special health care needs. • Be aware of any DNR orders. • When called to a school, make the school nurse a part of the EMS team effort. • Emergency readiness in schools is enhanced when EMS and school nurses are acquainted and collaborating.	***Resources*** *"The Comprehensive School Health Manual," Mass. Dept. of Public Health, School Health Program.* *For assistance with this topic, call the School Health Program, (617) 624-5477.*

CASE STUDIES

Child Abuse:

You are called to the home of a two-year-old male with a chief complaint of abdominal pain. When you arrive and assess the child, you see multiple bruises on the lower abdomen. How does your assessment progress?

- Check the chest, limbs, head and posterior surface for related injuries.
- Observe for abdominal distention.
- Request history of vomiting, character of pain, onset of symptoms.
- Quickly check the genitalia and perirectal area for signs of bruising or frank blood.

As you complete your assessment, the parent changes their mind about the need for EMS and refuses to allow you to transport the child to the hospital.

What do you suspect is the cause of this child's problem? How do you handle the parent's refusal of transport?

- Suspect the possibility of maltreatment.
- Enlist the help of local law enforcement.
- Stand by until police have dealt with the family.
- Transport to ED.

What history do you think is important to give the ED staff? How should this case be reported and to which authorities?

- Stress your physical assessment findings, as well as all interactions with the family.
- EMS personnel are mandated reporters of all cases of suspected child abuse, know your local laws and agencies.

SIDS:

You are called to the home of a three-month-old female, who was found to be in full cardiorespiratory arrest when the mother checked on the baby upon waking up this morning. The infant has cool pale skin, pooling of blood in dependent body parts, and dry eyes and oral mucosa. Mother is visibly upset, shaking and crying. What is your first priority?

- Initiate PALS guidelines for infant resuscitation.
- Assign one person to explain procedures to parent and obtain further history.

When the infant is pronounced dead, which individuals or agencies should be notified?

- Notify the medical examiner's office for all deaths in the field.
- Notify your local or national SIDS Center for parental support.

Bronchiolitis:

You are called to the home of a five-month-old boy with a complaint of respiratory distress. On arrival, you find an infant with a runny nose and fever. What are your assessment priorities?

- Assess airway patency.
- Assess degree of distress while breathing.
- Identify the signs of respiratory distress in a baby of this age. (Provider should include at least three of the following: wheezing, retractions, flaring, head bobbing, cough or tachypnea.)

During your assessment you note the presence of loud coarse and wet expiratory wheezing heard over all lung fields, copious nasal secretions, mild tachypnea, and mild intercostal retractions. What are your management priorities?

- Clear the airway by gentle suctioning if indicated.
- Provide humidified oxygen.
- Allow child to remain in parent's arms.
- Treat with nebulized Albuterol if indicated by medical control.
- Transport to care facility.

Febrile Seizures:

A 911 call is received with the information given that a 22-month-old male child is "twitching" and is blue. You arrive at the home of the child and are greeted by the anxious parents. They do not own a thermometer but noticed that he seemed to be "burning up" before his episode. They tell you that their child was diagnosed with an ear infection by their PMD earlier in the day. What are your findings on assessment?

- ABC's: The child has shallow respirations but is slightly cyanotic. CRT is 2-3 sec.
- LOC: The child is lethargic, does not appear to recognize parents, does not cry when examined.
- Vital signs: Rectal Temp: 39.5 (C); HR: 130; RR: 24, shallow; BP: 105/P
- PMH: as above, no recent head trauma, never hospitalized, no other significant history.
- Medications: started amoxicillin today, only 1 dose so far.

As you are completing your assessment, the child starts "twitching," a generalized seizure lasting approx. 1-2 minutes. What do you suspect is the diagnosis? Febrile Seizures. What are your management priorities?

- Position patient for safety
- Open airway
- Administer 100% FlO2
- Establish access and administer drugs per medical control
- Cool patient
- Support and inform parents
- Transport to ED

Cardiovascular Emergencies:

You are dispatched to a home for a 911 call. The anxious parents report that their 2-week-old baby looks blue. The mother also states that when she was changing the infant's clothing, she noticed that his heart felt like it was beating "really fast." She tells you that the baby has seemed a little irritable all day and hasn't fed well for her. What are your assessment priorities?

- ABCs: Airway is patent, appears slightly tachypneic and cyanotic; perfusion is poor; CRT is 4-5 sec.
- LOC: Irritable, slightly lethargic
- Vital signs: HR is too high to get accurate apical pulse; rate on C-R monitor is 230; RR: 70; BP: 75/P; afebrile
- PMH: benign; normal delivery; no recent illnesses
- Medications: baby vitamins

What is the most likely diagnosis? SVT. How will you manage this patient?

- Position baby to maintain open airway
- Administer 100% FlO2
- Establish access, using IO if necessary
- Adenosine per medical control (is this within scope of practice?)

- Synchronized cardioversion per medical control (is this within scope of practice?)
- Support and inform the parents
- Transport immediately to ED

Pediatric Trauma:

You are called to the scene of a 5-year-old child who was riding a bike and was struck by a car going app. 35 miles per hour. The child was thrown 15 feet and is supine on the side of the road. What are your priorities?

Remember the ABCs of trauma care:
- Open the airway with C-spine precautions
- Support ventilation as needed
- Intubate if necessary
- Get IV access

You evaluate the child; the initial GCS is 4, and you intubate without difficulty. During transport you are having increasing trouble with ventilation. What are your next steps?

Go back to your ABCs:
- If airway is patent, evaluate tube placement making a notation marking at the lip line.
- Check O2 source

Sepsis:

You are called to the home of a 12-month-old child. The mother states that the child has been sick for the past 4 days. There has been a decrease in intake, and the child has not had a wet diaper for 14 hours. The child is ill appearing. Eyes are sunken, the child is limp, skin turgor is poor. What are your treatment priorities?

ABCs:
- 100% O2 to assist respiration as needed
- Administer IV fluids: 20 cc/kg
- Get history of any other illness in the family

Upper Airway Obstruction:

A 3-year-old is choking on food. On your arrival, she is anxious, drooling and sitting forward. How would you intervene?

- Assess patency of airway, breath sounds and adequacy of ventilation.
- Check vital signs, including pulse ox.
- Obtain more history.

There is audible stridor with poor air entry bilaterally. Pulse ox is 88% and HR 130. She was eating when symptoms suddenly developed. What should you do now?

- Allow the child to remain with mother and supply supplemental oxygen.

As she is being moved to the stretcher, she becomes silent though still appears to be choking vigorously. She quickly becomes gray and unresponsive. What is your next move?

- Assess patency of airway, breath sounds and heart rate.
- Reposition the head and attempt BVM ventilation. If there is no improvement after several attempts, perform direct laryngoscopy and attempt to remove foreign body under direct visualization.

A piece of hot dog is successfully removed, and the child's condition improves. Transport.

Upper Airway Obstruction:

A 10-month-old has developed cough and noisy breathing over the last several hours. On your arrival, he is anxious and appears to be in respiratory distress. How would you proceed?

- Assess vital signs, including respiratory rate, heart and pulse oximetry.
- Assess work of breathing.
- Obtain more history.

The respiratory rate is 40, there are severe retractions. Air entry is poor. HR is 140, and pulse ox does not pick up. He has had some nasal congestion for the past several days and has developed a low grade fever today. Cough and respiratory distress developed in the afternoon and has worsened this evening. What interventions should you provide?

- Give humidified oxygen.
- Deliver racemic epinephrine by aerosol.
- Maintain child in a position of comfort.
- Reassess and transport.

Cardiopulmonary Arrest:

You are called for a 4-month-old infant who is gasping and cannot be aroused. On your arrival, the child is apneic and pulseless. What is your next step?

- Open the airway and begin BVM with 100% oxygen. Begin CPR.
- Prepare to intubate with 3.5 +/or - 0.5 ET tube. Assess tube placement.
- Ventilate at 50-60 bpm with 100% oxygen.
- Continue CPR and assess adequacy of compression.

There is now a HR of 40 on the monitor with absent distal pulses.

- Establish vascular access with IO.
- Epinephrine 1:10,000 0.1 cc/kg IO. May give ET if cannot secure IO.
- Assess breath sounds, pulse oximetry, heart rate and pulses.

Heart rate is 110 with thready distal pulses. Pulse ox does not pick up. Breath sounds are equal bilaterally with good chest wall excursion.

- May give 10-20 cc/kg bolus of normal saline, check dextrostick and transport.

Cardiopulmonary Arrest:

You are called to the scene of a 7-year-old asthmatic in severe respiratory distress. On your arrival, he is apneic with a pulse of 30. What do you do next?

- Establish an airway and begin bag-valve-mask ventilation. Begin CPR.
- Assess adequacy of ventilation and check for pulse with CPR.

There is poor air entry bilaterally, and there is a pulse with compressions.

- Prepare to intubate. ET tube size = $\frac{\text{age in years} + 16}{4}$
- Establish IV access.
- Which drugs might be helpful? sedation, atropine, muscle relaxant.

The child is intubated after sedation with midazolam. Tube position, breath sounds, pulse ox and pulse are assessed. Breath sounds are equal. Diffuse wheezes are heard. Pulse ox is 80%, and heart rate is 80. Now what?

- Administer subcutaneous epinephrine and albuterol aerosal via ET tube.
- Transport

Integrated Learning Experiences

Skills Lab	Practice pediatric airway management Practice intraosseous infusions Practice pediatric case scenarios to include: Foreign body obstruction Croup/epiglottitis Cardiopulmonary arrest Pediatric trauma
Hospital	Practice intubations in the cat lab Perform intraosseous infusions in the ED Assist in assessment and management of pediatric emergencies in ED Take all pediatric vital signs in the pediatric ICU or ED
Field Internship	Assist in assessment and management of pediatric emergencies in field

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General References

American Heart Association, *Textbook of Pediatric Advanced Life Support*., Dallas, TX, 1988.

APLS (Hopkins), *Practical Guide to Pediatric Intensive Care,* 3rd ed. (Blumer)

Eichelberger, MR: *Pediatric Emergencies*, Englewood Cliffs, NJ, Prentice Hall, 1992.

Video - *Street Medicine - Pediatric Emergencies*.